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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,788	10/17/2003	Shamci Monajembashi	SHA-001	9873
3897	7590	02/15/2007	EXAMINER	
SCHNECK & SCHNECK			WHALEY, PABLO S	
P.O. BOX 2-E				
SAN JOSE, CA 95109-0005				
			ART UNIT	PAPER NUMBER
			1631	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/15/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/687,788

Applicant(s)

MONAJEMBASHI, SHAMCI

Examiner

Pablo Whaley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 November 2006.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19,21,24-26,28 and 29 is/are pending in the application.  
4a) Of the above claim(s) 1-15 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 16-19,21,24-26,28 and 29 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *CLAIMS UNDER EXAMINATION*

Claims herein under examination are claims 16-19, 21, 24-26, 28 and 29 as they read on the elected Specie B (ii) (beams coupled via a system of lenses). Claims 20, 22, 23, and 27 have been cancelled. This application contains claims 1-15 drawn to an invention nonelected with traverse in the response filed 06/19/2006. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied, as necessitated by amendment. They constitute the complete set presently being applied to the instant application.

**CLAIM REJECTIONS - 35 USC § 112, 2<sup>nd</sup> Paragraph**

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 18 recites the limitation "fixed erythrocyte." It is unclear in what way said erythrocyte is "fixed" and what exactly it is fixed to, as the instant claims do not recite any methods steps directed to fixing erythrocytes. Clarification is requested. The Examiner has interpreted this limitation broadly for purposes of applying prior art.

**Claim Rejections - 35 USC § 103**

Applicant's arguments, filed 11/20/2006, that while Henon et al. teach erythrocytes, Henon et al. do not teach erythrocytes adhering to "target cells." Applicant's arguments with respect to claims 16, 18-26, 28, and 29 have been considered but are moot in view of the new ground(s) of rejections. These rejections are necessitated by amendment.

Claims 16-19, 21, 24-26, and 28 are rejected under 35 U.S.C. 103(a) as being made obvious by Henon et al. (Biophysical Journal, 1999, Vol. 76, p.1145-1151), in view of Jan et al. (THE JOURNAL OF GENERAL PHYSIOLOGY, 1973, Vol. 61, p. 638-654). This rejection is necessitated by amendment.

Henon et al. teach a method and system for measuring elastic coefficients of human erythrocytes using optical tweezers [Abstract]. More specifically, Henon et al. teach the following aspects of the instant invention:

- Adhering erythrocytes (i.e. target cells) bound (i.e. fixed) to silica beads [Abstract], as in instant claims 16 and 18.
- Optical tweezers comprising multiple laser beams used to apply force to erythrocytes bound to silica beads [Abstract and Fig. 1], as in instant claims 16, 19, 24, and 25.
- Optical tweezer system comprising lenses, a microscope, focused laser beams coupled into beam passage via lenses, and target objects [Fig. 1], as required by Species B (ii) and as in instant claims 21 and 28.
- Laser beam is focused at an observation point [p.1146, Col. 1, ¶ 1], which equates to a “focus” as in instant claim 21.
- Laser beam with wavelength of 1.064 micrometers [Fig. 1], which is a teaching for long wave as disclosed in the specification [p.8] and as in instant claim 26.

Henon et al. do not specifically teach adhering erythrocytes to “target cells” or coating objects with substances, as in instant claims 16 and 17. However, Henon et al. suggest coating RBCs with buffers to improve cell geometry [p.1145, Materials and Methods] and multiple trapping experiments applied to red blood cells [p.1145, Col. 1, ¶ 2].

Jan et al. teach methods for analyzing the role of surface electric charge in red blood cell interactions, wherein erythrocytes (e.g. auxiliary cells) are coated with substances that change the surface charge of the erythrocytes [Abstract], as in claim 17.

Thus it would have been obvious to someone of ordinary skill in the art at the time of the instant invention to adhere chemically aggregated erythrocytes taught by Jan et al. with bead-bound erythrocytes using the optical tweezer method and system of Henon et al., where the motivation would have been a clinical interest in developing improved methods for inhibiting red blood cell aggregation [Jan et al., Abstract], resulting in the practice of the instant claimed invention. One of skill in the art would have had a reasonable expectation of successfully combining these methods as both teach methods for analyzing erythrocytes in vitro and measuring shear forces experimentally.

Claims 16-19, 21, 24-26, 28 and 29 are rejected under 35 U.S.C. 103(a) as being made obvious by Visscher et al. (Cytometry, 1993, Vol. 14, p.105-114), in view of Jan et al. (THE JOURNAL OF GENERAL PHYSIOLOGY, 1973, Vol. 61, p. 638-654) and Shaw et al. (Cellular Microbiology, 2001, Vol. 3, No. 4, p.213-222). This rejection is necessitated by amendment.

Visscher et al. teach a method and system for inducing optical forces for manipulating a target comprising a microscope, multiple beams, optical tweezers, and long wave beams [Fig. 1], [p.106, Col. 2, ¶ 3], and [p.112, Col. 2, ¶ 2], as in claims 16, 19, 21, 24-26, and 28. Visscher et al. also teach unique multi-trap technique for indirectly trapping biological objects using optical tweezers, multiple cells, and polystyrene coated beads [p.113, Col. 1, ¶ 4 and Col. 2, ¶ 1] and [Fig. 7], as in claim 16. Visscher et al. also teach the use of a confocal scanning laser microscope for the micromanipulation of bacterial cells [Abstract], as in instant claim 29.

Visscher et al. do not specifically teach methods for adhering auxiliary cells to erythrocytes using substances that change the surface charge of the erythrocytes [Abstract], as in claim 17. However, Visscher et al. do teach the coating of beads with specific cell binding

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antibodies to improve trapping [p.113, Col. 2, ¶ 1], which suggests the coating of cells using adherent substances.

Jan et al. teach methods for adhering erythrocytes (e.g. auxiliary cells) to other erythrocytes using substances that change the surface charge of the erythrocytes [Abstract], as in claims 16, 17, and 18. Jan et al. also teach the use of electron microscopic studies to analyze erythrocyte surface interaction [p.646, Section 3], which motivates the use of confocal microscopy.

Thus it would have been obvious to someone of ordinary skill in the art at the time of the instant invention to combine the use of coated erythrocytes taught by Jan et al. with the bacterial cells and the cell trapping method of Visscher et al., where the motivation would have been to study cell-bacterial interaction by trapping irregular shaped bacteria using multiple erythrocytes [Visscher et al., p.113, Col. 1, ¶ 3], resulting in the practice of the instant claimed invention. One of skill in the art would have had a reasonable expectation of successfully using bacterial cells and the multi-trap system of Visscher et al. with the erythrocytes of Jan et al. methods for studying erythrocyte and red blood cell interaction are well known in the art [Shaw et al., Abstract].

## CONCLUSION

No Claims are allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pablo Whaley whose telephone number is (571)272-4425. The examiner can normally be reached on 9:30am - 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Irem Yucel can be reached at 571-272-0781. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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